

ERGOTEC ASSOCIATION, INC.

Human Engineering Non-Profit

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October 7, 1996

OCT - 8 1996

ATTN: Mr. Reed Hundt
Commissioner
Federal Communications Commission
1919 M Street, NW
Washington, DC 20554

Federal Communications Commission
Office of Secretary

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DOCKET

Re: EMR Hazard -- Example: LEHMAN RESIDENCE -- FCC File BPH-840725AD
FOR FILE: FCC DOCKET 93-62 -- Health and Safety Standard

OPPOSITION
TO INDUSTRY'S REQUEST TO ADOPT
ANSI AS THE OFFICIAL
HEALTH AND SAFETY GUIDELINE

Citizens want to know, "Does our health and safety really matter to government officials? Does the voice of people count? Do Americans really have property rights? Do we still have the constitutional right to enjoy life, health, safety, and the pursuit of happiness?"

Subversively the federal government passed the Telecommunications (Telecom) Act of 1996. Before that time industry was proceeding at break-neck speed to put cellular and Personal Communications Service (PCS) in place. Industry has accelerated antenna installation to a maddening pace. Soon industry will introduce digital Local Multipoint Distribution Service (LMDS), Fixed Satellite Service antennas on **ANY existing and new structures** (eg, buildings, water towers, lampposts). Mayor Guiliani is contemplating approval of PCS antennas on thousands of lampposts in the 5 boroughs of Manhattan simply because: (1) Omnipoint won a license; (2) per the Telecom Act, cities cannot deny applicants a permit to install antennas; (3) city officials, including health professionals, cannot address health and safety issues! This means industry has carte blanche to abuse citizens in any way they choose. Why? Representative Edward Markey, and Congress as a whole, deemed it so. By signing the unconstitutional Telecom Act, President Clinton revoked the rights of the American people. The Inter-Agency Group (EPA, NIOSH, OSHA, FDA) suggested adoption of a health and safety standard that is lower than that of the American National Standards Institute (ANSI). Industry insists the ANSI guidelines adequately protect the public from biological injury inflicted by electronic product EMR, an invisible pulsed vibrating agent, that neither industry nor their consultants nor health officials understand. Citizens have informed responsible officials in the Inter-Agency Group that the **tens of thousands of antennas** industry proposes to mount on high structures in every ecosystem nationwide render **ALL STANDARDS INADEQUATE**. Radiation from several million antennas will injure humans. The dense umbrella of cumulative radiation (electro-smog)

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will destroy all living creatures and our environment. Officials have been warned, but turn a blind eye and deaf ear. **FCC is not a health and safety agency.** The ANSI guidelines it is asked to adopt are those designed by industry, which are self-serving to industry. Below is just one example of industry's inhumanity which multiplies every second. It is the story of Donald and Barbara Lehman of Mount Kisco, New York.

The mansion of Donald and Barbara Lehman. This couple bought a home, Darlington Castle, for over \$1 million in Mount Kisco, NY (1993). Indeed they **were aware of the WMJU-FM radio antenna (106.3 MHz) on the castle's roof.** But they had not been informed about the potential health hazards arising from exposure to radio frequency (RF) electromagnetic radiation (EMR). They loved the beautiful old stone 2-story building, plus basement and attic, which has a living area of 132 by 64 feet (8448 square feet). The house is situated on over 50 acres. It stands 446 feet above the basic terrain. Two FM antennas are attached to an 8-foot pole on a stone parapet on the roof. Thus the overall height of the antenna is around 460 feet above the basic terrain (446 feet + 8 feet + 2-foot parapet). From a deck on the roof of their home the Lehman's have an unobstructed view of the twin towers of the World Trade Center, Empire State Building, and other tall buildings having many antennas on their roofs. Antennas also enjoy the same view, and with a clear line of sight can readily communicate with various antennas on the roofs of tall buildings in New York City and high elevations in Westchester County.

In the spirit of competition, sanctioned by Congress through the Telecom Act of 1996, Commodore Media recently purchased WMJU (renamed WZZN), which operates at 106.3 MHz. The station's effective radiated power (EFR) is 1600 watts (1.6 kW). Another FM repeater radio station added to the antenna mast on Darlington Castle transmits at 105 MHz; about 1500 (1.5 kW) EFR. The attic of the castle houses the FM antennas' electronic transmitter equipment. In the basement of the home, NYNEX has installed telephone switching equipment. Why? NYNEX, nor Commodore Media, will divulge the reason. But it is surmised that, in the spirit of competition, NYNEX will soon offer e-mail, Internet, and other information services that can be transmitted via telephone lines. Meanwhile, through simulcasting, Commodore will earn many advertising dollars by *repeating* the same advertisements from the same advertiser to many communities at relatively low cost.

And where are the Lehman's in relation to the antennas broadcasting from, and telephone equipment in, their home? These people are like canaries in a mine! They live sandwiched between the antennas on the roof and transmitter equipment in the attic, and telephone switching equipment in their basement. Donald Lehman's office is on the second floor immediately below the antennas. Donald and Barbara Lehman sleep in the master bedroom below the attic transmitter room. After all, **their house is a radio tower** sanctioned by the Federal Communications Commission!! The Lehmans **live in the NEAR-FIELD** of Commodore Media's FM antennas!

Carl T. Jones Corporation of Springfield, Virginia measured RF radiation at the Lehman residence. Reading only the electric field and power density from *ONLY* the WJMU-FM antenna, Jones calculated extremely low energy in the master bedroom and intermediate strength emissions in the attic (report attached). He gave the home a livable clean bill of health. How can that be? The antennas on Lehmans' castle cause interference in electronic equipment in their home (eg, televisions, telephones, fax machine). Residents outside the Lehmans' 50 acres also report radio interference from the 105 and 106.3 MHz antennas (total 211 MHz)! Since it disrupts and damages electronic equipment within a several mile radius,

what prevents EMR from penetrating the bodies of the Lehmans and their neighbors? What is the biological effect of cumulative EMR (211 MHz) from just two antennas, plus emissions from the electric power required to drive the frequencies, doing to the Lehmans who are perched in the NEAR FIELD of the antennas!? Industry says, "No bioeffect is possible because **scientific data is inconclusive!**" Is this logical reasoning? The Lehmans want the antennas removed from their residence but Commodore Media, like former owners, plays down the probability of health hazards from EMR. And if cancer and other opportunistic disease manifests in the Lehmans and their neighbors, industry consultants will attribute the disorders to chance.

The ANSI standard, which is actually a guideline, industry wants FCC to adopt defines a *controlled* environment (near antennas) as one in which "*a person is aware of EMR exposure.*" Laborers and engineers working near antennas must operate in the controlled area. The Lehmans live and work in such an environment. Are they exempt from RF protection because **they are aware of the antennas and live in a plasma of EMR** showered over them from the roof and through their walls? Conversely, an *uncontrolled* environment (away from antennas) is one in which individuals, such as the general public, "**are NOT aware of the presence of EMR.**" Obviously officials at health and safety agencies, and FCC, overlook the fact that the ANSI standard was written to protect people from the emissions of JUST ONE antenna. With the tens of thousands of antennas required to support wireless phones (cellular, PCS, LMDS), and other mobile satellite driven digital systems, **the whole population will always be exposed to EMR and live in what amounts to a controlled environment.** In other words industry, assisted by government, is making it so that humans can never dodge antenna and electronic product EMR.

FCC and other government officials would be wise to give humans and creatures a chance to live in a safe environment. For the sake of humanity, adopt the hybrid (NCRP/ANSI) health and safety guidelines recommended by the Inter-Agency Group. Industry must conform, and lower the emissions of their antennas and electronic systems. If you doubt the public is concerned about their health, it is recommended FCC make a televised public announcement such as: "It is debated that EMR causes biological disorders. Do you want to use wireless communications regardless of the bioeffect? There could be a long-term health problem from constant EMR exposure." This is the least government can do to inform the American people of the potential danger of being continuously exposed to EMR!

Please see the attached *Report of the US General Accounting Office* (1978) stipulating the hazards of "nonionizing EMR." If EMR was found to be hazardous in 1978 when few antennas rose above the height of trees and buildings, the tremendous implications of biological damage from widespread EMR exposure in the 1990s is horrendous. FCC officials, please err on the side of prudence. Adopt the Inter-Agency Group guidelines that have a lower limit of permissible EMR exposure.

Respectfully submitted,


Bert Dumpé - CEO

cc: FCC Commissioners, Inter-Agency Group

Attachments



UNITED STATES GENERAL ACCOUNTING OFFICE
WASHINGTON, D.C. 20548

COMMUNITY AND ECONOMIC
DEVELOPMENT DIVISION

B-166506

The Honorable Elizabeth Holtzman
House of Representatives

Dear Ms. Holtzman:

In accordance with your August 3, 1977, request and subsequent agreements with your office, we have reviewed Environmental Protection Agency (EPA) efforts to protect the public from environmental nonionizing radiation exposures, including microwave radiation. EPA is responsible for eliminating or reducing unnecessary potentially harmful health effects by limiting exposure from radiation sources.

Nonionizing radiation has become a subject of national concern because of the rapid increases in its use and its potential harm to public health. The population is receiving measurable exposures to nonionizing radiation. The sources are increasing, and the health effects of such exposures at low levels are controversial.

Currently, there is no official U.S. environmental public health standard for exposure to nonionizing radiation sources. According to EPA, research programs to detect and evaluate biological effects of nonionizing radiation have not yet generated a sufficient data base on which quantitative and scientifically sound radiation protection standards can be established for microwave and other nonionizing frequencies. EPA plans to decide on the need for protection standards in March 1978, developing Federal guidance by April 1979, if determined necessary.

The EPA protection activities and existing exposure standards are summarized in the appendixes. We have discussed it with EPA representatives and have considered their comments in this report.

B-166506

As arranged with your office, unless you publicly announce its contents earlier, we plan no further distribution of this report until 3 days from the date of the report. At that time we will send copies to interested parties and make copies available to others upon request.

Sincerely yours,

Henry Eschwege

Henry Eschwege
Director

RELEASED 4/5/78

15461
REPORT BY THE U.S.

General Accounting Office

Efforts By The Environmental Protection Agency To Protect The Public From Environmental Nonionizing Radiation Exposures

The subject of nonionizing radiation has become a national concern because the population is receiving measurable exposures to the radiation. The health effects of such exposure even at low levels are controversial.

Currently, there is no official U.S. environmental public health standard for exposure to nonionizing radiation sources, because U.S. research programs have not yet developed sufficient data to establish standards for microwave and other nonionizing frequencies.

The Environmental Protection Agency is responsible for eliminating or reducing potentially harmful health effects by limiting exposures from radiation sources. This report discusses Agency activities to (1) evaluate the need for protection standards and (2) establish such standards where necessary.



CED-78-79
MARCH 29, 1978

EFFORTS BY THE ENVIRONMENTAL PROTECTION AGENCY
TO PROTECT THE PUBLIC FROM
ENVIRONMENTAL NONIONIZING RADIATION EXPOSURES

BACKGROUND

Everyone is exposed continuously to nonionizing radiation. Nonionizing radiation is radiation occurring in the electromagnetic wave spectrum used primarily by sources operating at radio (10 MHz to 300 MHz) and microwave frequencies (300 MHz to 300 GHz). ^{1/} This form of radiation, contrasted to the familiar ionizing radiation sources, such as X-rays and nuclear radiation, differs on (1) how it affects the human body and (2) its potential for causing harm. A quantity of nonionizing radiation energy, for example, contains far less energy, approximately one million times less, than amounts of ionizing radiation which can do significant biological damage. Significant sources producing nonionizing radiation include

- radio and television broadcast antennas,
- radars,
- industrial heating equipment,
- mobile communications systems,
- satellite communications system earth terminals,
- microwave ovens, and
- point to point microwave communication systems.

Other nonionizing radiation sources include lasers, ultraviolet lamps, and overhead extra-high voltage power lines. A simplified electromagnetic energy spectrum is shown in appendix II.

Health effects

Nonionizing radiation energy gets absorbed by human tissue and does interact with biological systems.

^{1/} Megahertz and Gigahertz are units of frequency equal to one million to one billion cycles per second.

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Human exposure at high levels--above 10,000 microwatts/square centimeter ($\mu\text{W}/\text{cm}^2$)--increases body temperature and results in such problems as heat stress, cataract formation, cardiovascular effects, testicular effects, and brainwave pattern changes.

The effects of exposure at low levels is a subject of controversy. Effects of exposure to $1,000\mu\text{W}/\text{cm}^2$ or less have not been well documented, and U.S. scientists do not all agree that such effects exist. On the basis of animal research and statistical studies of workers' exposure histories and medical records, some Russian, Polish, and Czech scientists believe that exposure to low levels have effects on the human body. Considered mainly temporary central nervous system effects, symptoms attributed to low-level exposure include headache, weariness, dizziness, irritability, emotional instability, partial loss of memory, loss of appetite, cardiovascular effects, electroencephalogram changes, blood chemistry changes, changes in respiration, and possible genetic effects.

There are also some nonionizing radiation effects that result in interference with the operation of electronic equipment. Such effects can cause physical injury when they involve disruption of cardiac pacemakers; telemetering devices in hospitals; and critical communications used in aircraft guidance and police, fire, and rescue activities.

POTENTIAL RADIATION DANGER

The significance of this radiation to public health depends on the amount of the population exposed, the exposure time, the frequency and the power levels involved. EPA estimates the potential danger from nonionizing radiation has risen dramatically since 1945, when levels were very low. EPA estimates radiofrequency and microwave sources alone to be increasing by 15 percent annually. Sources producing radiation which impacts directly on the public include approximately 350 UHF TV stations, 600 VHF TV stations, 3,400 FM stations, and 4,400 AM stations; tens of thousands of search, navigation, and weather radars; hundreds of thousands of microwave communications towers; and millions of microwave ovens. EPA states that these sources result in measurable exposures to the population and are becoming a major concern because

- the harmful environmental levels are not known,
- the number of sources is rapidly increasing, and

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--the U.S. standard for extended human occupational exposure to microwave radiation is approximately 1,000 times greater than the Soviet Union's published standard.

In Eastern Europe exposure standards protect against nonheating effects of long-term exposure to low-level radiation. In this country and most Western European countries, standards were designed to protect against heating effects from high-level exposures. The existing occupational and environmental exposure standards for various countries are shown in the following table.

Simplified Nonionizing Radiation Standards
(note a)

Environmental Exposure ($\mu\text{W}/\text{cm}^2$):

	<u>U.S.</u>	<u>U.S.S.R.</u>	<u>Czechoslovakia</u>	<u>Poland</u>
Above 300 MHz	none	1	2.50	10
30 - 300 MHz	none	1	.25	13

Occupational Exposure ($\mu\text{W}/\text{cm}^2$):

Above 300 MHz	10,000	10	25	200
30 - 300 MHz	10,000	6	25	106

a/ Such standards also include provisions for exposure times where greater exposures are allowed for short periods of time (e.g. the U.S. standard allows exposures of more than 10,000 $\mu\text{W}/\text{cm}^2$ for periods of less than 6 minutes).

Although there are no U.S. environmental standards for nonionizing radiation, including microwaves, the Food and Drug Administration (FDA) does have a microwave oven performance standard limiting the permissible microwave radiation leakage from the device itself, rather than establishing a maximum exposure level an individual might receive.^{1/} The leakage limit for new ovens is 1,000 $\mu\text{W}/\text{cm}^2$, measured at any point 5 centimeters from the surface of the oven. Ovens in service may degrade to levels no greater than 5,000 $\mu\text{W}/\text{cm}^2$ at the same distance.

^{1/}This standard and the FDA efforts to protect the public from microwave radiation-emitting products is the subject of an ongoing GAO review to be issued later this year.

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The occupational standard established by the Occupational Safety and Health Administration (OSHA) recommends allowable limits of $10,000 \mu\text{W}/\text{cm}^2$ for specific periods. This standard was based on a 1966 standard established voluntarily by the American National Standards Institute. The U.S. military also controls exposure using regulations that are consistent with OSHA standards. In contrast, comparable U.S.S.R. standards limit exposure to $10 \mu\text{W}/\text{cm}^2$ for the duration of a working day, with higher exposures allowed for shorter periods, such as up to $1,000 \mu\text{W}/\text{cm}^2$ for 20 minutes of the working day.

In a December 31, 1975, decision, an Occupational Safety and Health Review Commission judge held that the OSHA standard was considered an advisory rather than a mandatory standard. In addition the Assistant Secretary for Occupational Safety and Health, Department of Labor advised EPA in a September 17, 1976, letter that the standard is only a recommended guide. Therefore, the standard is generally regarded as nonenforceable.

EPA and OSHA officials agreed that the current OSHA nonionizing radiation standard should be reviewed because it was established 12 years ago and better scientific data is now available. On October 28, 1977, the National Institute for Occupational Safety and Health (NIOSH) announced plans to study and to recommend new occupational exposure standards to the Department of Labor in 1979 for radiofrequencies and microwaves.

In other areas FDA's Bureau of Radiological Health (1) has issued a Federal performance standard for lasers, (2) has reissued guidance on the hazards of mercury vapor lamps, and (3) is working on a performance standard draft for microwave diathermy applicators.

EPA'S RADIATION AUTHORITY

EPA is responsible for protecting the American people and environment from avoidable exposure to radiation. These responsibilities involve providing recommendations to the President for Federal agency guides to (1) develop and issue environmental standards for radioactive materials, (2) perform environmental impact analyses, and (3) maintain assessments of environmental radiation levels. This latter responsibility requires an active environmental monitoring program.

The 1970 Reorganization Plan Number 3 directs EPA to advise the President on radiation matters that directly or

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indirectly affected human health.^{1/} Thus, if approved, EPA recommendations would be published as guidance to all Federal agencies in formulating radiation standards. The authority does not provide for direct EPA enforcement, but rather would be implemented and enforced in specific regulations and procedures of agencies, such as the Nuclear Regulatory Commission; the Department of Defense; the Federal Communications Commission; and the Departments of Transportation; Labor; Health, Education, and Welfare (HEW); and Energy.

This EPA guidance authority is also a controversial subject. HEW officials question whether EPA can legally issue nonionizing radiation guidance, stating that existing EPA authority applies only to nuclear materials. Our January 20, 1978, report discussed such jurisdictional disputes and recommended to the Congress that EPA's role in environmental and public health radiation protection be better defined to clearly delineate its responsibilities.

EPA officials believe that their current authority to issue guidance to Federal agencies may be adequate to control environmental nonionizing radiation exposure. If EPA later determines, however, that the scope of exposure is extremely large and many radiation sources are not under present control, then EPA will have to seek new regulatory legislation and funding to set enforceable standards. To implement and enforce nonionizing radiation controls, EPA officials stated that a much greater entity would be needed than EPA, at its present size.

EPA'S PROTECTION EFFORTS

EPA is studying hazardous health and other radiofrequency and microwave radiation side effects. EPA's objective is to determine health and environmental impacts of this form of nonionizing radiation to assess the need for establishing standards for environmental levels and providing guidance for controlling environmental exposures.

Because of increased public use of microwave radiation, and a determination that radio broadcast activities are the major source of population exposure to nonionizing radiation, EPA has directed its program study to determine levels and effects of these two nonionizing radiation sources.

^{1/}This radiation authority was the subject of a GAO report "The Environmental Protection Agency Needs Congressional Guidance and Support to Guard the Public in a Period of Radiation Proliferation" (CED-78-27, January 20, 1978).

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EPA's concern with environmental nonionizing radiation arises from two exposure situations. One is the relatively high-level exposure in the immediate vicinity of individual high-powered sources, such as satellite communications, airport radars, broadcast antennas, industrial process applications, and military electronic applications. The other situation is low-level exposure from the overlapping of radiation from many sources. Both situations can result in exposing large populations to significant environmental levels of nonionizing radiation.

EPA environmental radiation activities are divided between the Office of Radiation Programs and the Office of Research and Development. Standards development, environmental measurements, and environmental evaluation are conducted by the Office of Radiation Programs. Biological effects research is conducted by the Health Effects Research Laboratory, Research Triangle Park, North Carolina, which is part of the Office of Research and Development. Environmental exposure data is collected, evaluated, and compared to known effects and research results to assess needs for criteria, guidelines, or standards to control exposure.

Measurement activities

EPA initial efforts at measuring the extent of nonionizing radiation began in 1973, concentrating on recognized high-powered sources in the categories of UHF TV, VHF TV, and FM broadcast stations; tracking and search radars; and satellite communication terminals.

With a staff of five professionals, EPA is currently obtaining data on environmental levels of radiofrequency and microwave radiation in U.S. urban areas. Data is being collected with a measurement system housed in a mobile van. This program is identifying levels of environmental radiation which exist at selected locations. The program is also establishing reference levels against which changes in environmental quality can be evaluated to determine trends or to anticipate future radiation levels. By assessing the population distribution around these locations, EPA can provide population exposure estimates.

As of February 1978, EPA had collected measurements in 11 metropolitan areas, and will continue similar studies in Denver, Los Angeles, San Francisco, and Seattle during the next 18 months. The highest levels measured were about 150 $\mu\text{W}/\text{cm}^2$. According to EPA officials, the overall median exposure levels measured in urban areas were quite low (less than 1 $\mu\text{W}/\text{cm}^2$). About 98 to 99 percent of the population would appear to be exposed to levels meeting even the very

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strict Soviet standard. One or two percent of the general population, however, may be exposed to higher levels. For example, EPA measurements approached $2,000 \mu\text{W}/\text{cm}^2$ at the base of an FM antenna on Mt. Wilson, California. Measurements in excess of $180,000 \mu\text{W}/\text{cm}^2$ were found on the FM tower itself, thus creating concern for workers who need to climb such towers.

Health effects research

In addition, EPA research facilities at Research Triangle Park are developing health effects data to investigate the possible low-level effects findings of the Soviet Union. The fiscal year 1978 research effort of \$930,000 and 30 staff years is devoted to the study of rats, mice, and monkeys chronically exposed to various power densities including low radiation levels. A summary of recent EPA research projects is shown in appendix III.

Whether low-level environmental exposures constitute significant health risks remains an open question. EPA is finding preliminary results that such exposures may affect the immune system; create anomalies in mouse litters, such as hernias of the brain; and produce a trend toward lowered behavioral performance. Although the significance of these preliminary results is still being evaluated, EPA officials agree that to dismiss the Soviet observations of low-level effects would be a mistake.

Researchers we interviewed said delays in starting projects in the research program and in possible future program personnel reductions were affecting morale and would significantly delay program results. The researchers believe more effort is needed to base a good scientific decision on standards development, including additional resources for epidemiological and clinical investigations of effects on humans. Additional animal studies on the chronic low-level environmental exposure are also needed.

COORDINATION OF FEDERAL PROTECTION ACTIVITIES

EPA's coordinating effort is through the Office of Telecommunications Policy (OTP) of the Executive Office of the President. Currently, most Federal research activities concerned with the biological effects of nonionizing radiation are overviewed by OTP. OTP exchanges present and past scientific and technical data with all Federal agencies, informing them of proposed future efforts. OTP also provides

an overview of the entire research effort, sometimes suggesting the type of research needed. OTP efforts are based strictly on voluntary participation by Federal agencies.

Understanding the biological effects of nonionizing radiation is a developing field requiring much input from various sources. The problems associated with nonionizing radiation are, therefore, the responsibility of many Government agencies, each having its own scope and level of effort. For example, HEW is responsible for establishing performance standards to control radiation from electronic radiation-emitting products, such as medical diathermy or microwave devices. The Department of Labor is responsible for occupational health and safety, and EPA, is responsible for environmental and public health aspects. The Department of Defense is also involved in such research. An estimated \$9.5 million was spent by the Federal Government in fiscal year 1976 on radio and microwave frequency health effects research.

There is concern over a proposed Federal reorganization plan to abolish OTP and transfer its function to the Department of Commerce. The radiation effort is only one of OTP's functions, but according to those interviewed, the loss or reduced emphasis to this function could result in ineffectiveness in the long run in many current U.S. radiation research efforts.

PROGRAM STRATEGY AND UNCERTAINTIES

EPA identified three major program uncertainties to be overcome in the nonionizing radiation area.

- Existing ambient environmental levels and their rates and patterns of growth should be determined.
- Criteria for specifying acceptable environmental levels should be established.
- The existence of nonheating effects, which are potentially detrimental to public health and welfare, should be confirmed.

EPA officials stated that a decision on the need for protection standards for population exposure to nonionizing radiation should be made in March 1978, and if determined necessary, Federal guidance development should be completed by April 1979. EPA presently believes that, on the basis of currently available data, protection guidance will probably be necessary.

CONCLUSIONS

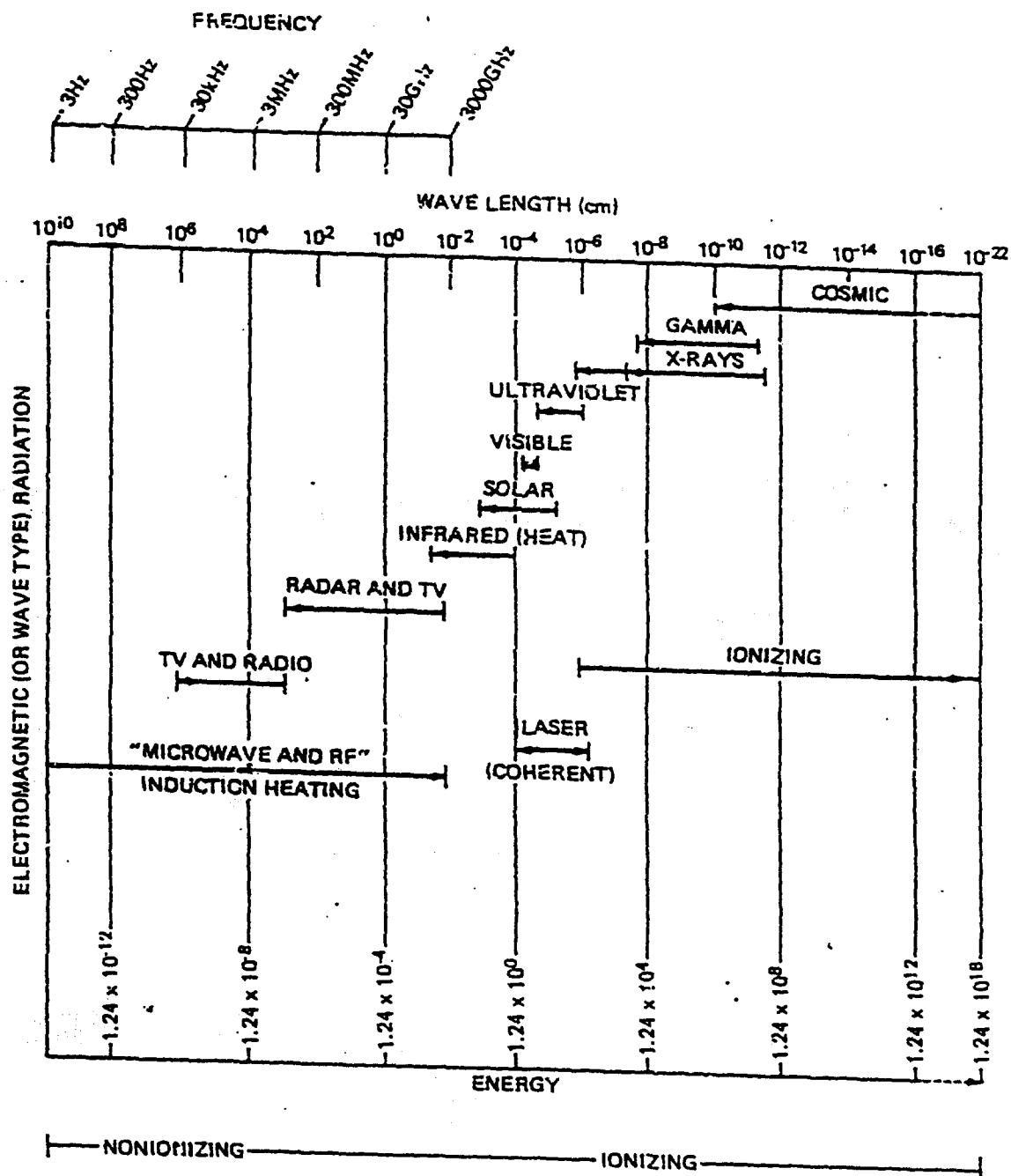
The population is receiving measurable exposures to nonionizing radiation. The sources are increasing while the health effects of such exposures at low levels is a controversial subject. Other countries have developed and issued both occupational and environmental standards for nonionizing radiation. Research programs, including EPA efforts to detect and evaluate biological effects of nonionizing radiation, have not yet been able to generate a sufficient data base on which quantitative and scientifically sound radiation protection standards for microwave and other nonionizing frequencies can be established. The current OSHA nonionizing radiation standard has been challenged for its enforceability and its protection adequacy.

EPA is continuing to examine the need for issuing Federal guidance for environmental nonionizing radiation. If EPA determines environmental nonionizing radiation exposure control is needed depending on the extent of control necessary, EPA may need to seek new legislation to set an enforceable standard.

Many Government agencies are responsible for nonionizing radiation problems, each having its own scope. Most Federal research on the biological effects of nonionizing electromagnetic radiation are currently being overviewed by OTP. OTP has suggested program direction for needed Federal research vital to the nonionizing biological effects radiation area.

A proposed Federal reorganization plan includes the abolishment of OTP and the transfer of its functions to the Department of Commerce. The plan concerns EPA, OTP, and other Federal agencies involved in nonionizing radiation. Their concerns are whether the current OTP program will still be emphasized. Nonionizing electromagnetic radiation is a large and complex area and strong coordination is vital. A lack of Federal program coordination or overview could hamper not only EPA efforts in determining needs for environmental nonionizing radiation exposure controls, but other Federal Government radiation control activities as well.

SIMPLIFIED ELECTROMAGNETIC ENERGY SPECTRUM



SOURCE: EPA

APPENDIX III

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EPA Nonionizing Radiation Health Effects ResearchOngoing During FY 1977 and First Quarter FY 1978

<u>Frequency (MHz)</u>	<u>Power density range ($\mu\text{W}/\text{cm}^2$) (note a)</u>	<u>Species</u>
2450 (microwave oven)	5	Rats
2450	5-30	Mice
2450	5-30	Rats
2450	3.4-28	Mice
2450	5-28	Rats
2450	0.1-10	Monkeys
2450	0.3-9	Enzymes
425 (UHF-TV)	10	Rats
425	10	Rats
9000 (search radar)	10	Mice
9000	1-40	Bacteria
1000 (TACAN radar)	2-200	Dogs
147 (aircraft instrument landing systems)	0.5-2	Chicks
100 (FM radio)	25	Rats
DC	10-40,000 Volts per meter	Chicks

a/ milliwatts per square centimeter

Source: EPA.

(087504)



ENGINEERING REPORT
RADIO FREQUENCY RADIATION
MEASUREMENT SURVEY

LEHMAN RESIDENCE
33 CHARLES ROAD
MOUNT KISCO, NY

AUGUST, 1995

CARL T. JONES
CORPORATION

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CARL T. JONES
CORPORATION

ENGINEERING REPORT
RADIO FREQUENCY RADIATION MEASUREMENT SURVEY
LEHMAN RESIDENCE
33 CHARLES ROAD
MOUNT KISCO, NY
AUGUST, 1995

1.0 Introduction

This office has been retained by Donald and Barbara Lehman to perform radio frequency radiation measurements at their residence, located at 33 Charles Road, Mount Kisco, New York. The Lehman residence is also the location of the transmission facilities of FM Broadcast Station WMJU-FM. The WMJU-FM main and backup transmitters are housed in a room located on the third floor (attic) of the house. The transmit antenna is located on the roof of the house, immediately above the transmitter room. Because of the proximity of a high powered FM broadcast station to the living areas of the home, the Lehmans are concerned with the levels of radiation present in their home and on the surrounding grounds.

A radio frequency radiation measurement survey was performed, by the undersigned, between the hours of approximately 9:30 AM and 2:00 PM on July 25, 1995. Measurements were performed on the first, second and third floors of the Lehman residence, as well as, on the roof where the WMJU-FM transmit antenna is located. Measurements were also performed on the grounds surrounding the Lehman home. The following paragraphs provide a description of the measurement equipment and procedures used and present the measurement results.

2.0 Measurement Equipment

Radio frequency radiation measurements were performed with a Narda electromagnetic survey meter and associated E-field and H-field probes. In addition a Potomac Instruments FIM-71 VHF field strength meter was used to supplement the Narda meter in some locations within the home, where the measured E-field and/or H-field was below the resolution of the Narda meter/probes.

Details of the equipment used to perform the radio frequency measurements are contained in the table below:

TYPE	SERIAL NUMBER	CALIBRATION DATE
Narda Electromagnetic Survey Meter Model 8718	1008	4-24-95
Narda E-Field Probe Model 8761	9011	3-24-95
Narda H-Field Probe Model 8733	4015	3-24-95

3.0 Measurement Procedures

Prior to making detailed measurements, initial measurement scans were performed on each floor of the house to identify areas where the E-field or H-field approached the maximum permissible exposure (MPE) for uncontrolled environments as defined in the

"IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz" (ANSI/IEEE 1991 Standard). An uncontrolled environment is defined, in the ANSI/IEEE 1991 Standard, as any location where individuals have no knowledge or control of their exposure to electromagnetic fields. The living areas of the Lehman home are considered an uncontrolled environment. The MPE for uncontrolled environments can be expressed in terms of an equivalent plane wave power density. At the operating frequency of WMJU-FM (106.3 MHz), the MPE for uncontrolled environments is 0.2 milliwatts per centimeter squared (mW/cm^2).

Initial measurement scans were performed using both the magnetic and electric field probes by slowly walking through the living areas of the Lehman home, with the probe extended to an approximate head-high position, while monitoring the field level on the meter. This procedure identified no locations where the field was above the minimum resolution of the meter.

In order to determine the approximate level of the electric field in certain rooms of the house, the Potomac Instruments FIM-71 VHF field intensity meter was used. The VHF field intensity meter was set up near the center of the room with the antenna horizontally polarized and extended to a height four to six feet above the floor. The antenna elements were set for the proper length and the antenna rotated for maximum pickup. After the unit was calibrated, a horizontally polarized E-Field measurement was made. The antenna was then rotated to a vertically polarized orientation and, in each case, it was observed that the field was lower in the vertical polarization than in the horizontal polarization. Only the horizontally polarized field strength was recorded.

In the master bedroom, the Lehmans' have experienced interference to television reception. The worst interference was observed on Channel 13, where the receiver lost

sync due to the presence of an interfering signal. In this room electric field strength measurements were performed, with the VHF field intensity meter, at both the WMJU-FM fundamental frequency and the second harmonic frequency. The second harmonic frequency falls within the video passband of VHF Channel 13.

After completing the measurements within the living areas of the Lehman home, measurements were performed on the roof using the Narda meter and the E-field and H-field probes. An initial scan at both head level and gonad level revealed fields near, and at some locations, above the MPE for uncontrolled environments.

The roof area of the Lehman home is considered to meet the definition of a controlled environment in accordance with the ANSI/IEEE 1991 Standard. Access to the roof area is restricted by a locked door such that only persons knowledgeable of the exposure risk have access to the roof. Further, signage is posted at the entry to the stairwell and at the hatch to the roof warning of the potential for exposure to high electromagnetic fields and providing instruction should access be required. The MPE for controlled environments is 1.0 mW/cm^2 (five times that of the uncontrolled environment).

Eight measurement locations, equally spaced over the roof area, were selected for E-Field measurements in order to provide a general idea of the fields present. At each measurement location, the probe was held head-high extending toward the antenna and away from the measurement engineer's body. Because of the high field gradient experienced on the roof, the cable between the probe and the meter was coiled to minimize the potential difference between the probe and the meter. At each location the average equivalent power density was measured and recorded for a thirty second averaging time. The probe was then lowered to gonad level and at each measurement

location it was observed that the power density was lower at this level.

After the eight measurements were recorded, the roof was carefully scanned with the probe at head level in order to identify any E-Field "hot spots". As a result of this scan measurements were made at four additional locations. The roof was then scanned with the probe at gonad level and one additional measurement was performed.

After completing the E-Field measurements, H-Field measurements were performed on the roof using the same procedure as that for the E-field measurements. H-Field measurements were first performed at the same eight geometrically spaced locations as were measured with the E-Field probe. A careful scan was then performed at a head high level to identify any H-Field "hot spots". As a result of this scan two additional locations were measured. A scan performed at gonad level showed levels lower than at head level and, therefor, no additional measurements were recorded with the probe at this level.

After completing the roof measurements a scan of the yard surrounding the house was performed with the E-Field probe. The scan was performed in the same manner as that within the house. As a result of this scan, the average E-field equivalent power density was measured at one location which represented the highest level observed.

4.0 Measurement Results

The measurement results have been segmented into three parts to correspond with the three general areas in which measurements were performed: 1) the living areas of the house; 2) the roof and; 3) the grounds surrounding the house. The WMJU-FM transmitter operating parameters are also presented in this section of the report.

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4.1 WMJU Transmitter Operating Parameters

The WMJU-FM transmitter operating parameters were read and recorded twice during the measurement survey. On both occasions the plate voltage was 3.5 kilovolts and the plate current was 0.72 amperes. The output power meter on the transmitter was inoperable. Based on the nominal efficiency of the Harris transmitter in use, the length of transmission line employed and the two-bay circularly polarized antenna employed, the station appeared to be operating at or near its licensed effective radiated power.

4.2 Measurement Results - Living Areas of the House

Initial scans on the first, second and third floor living areas of the Lehman home revealed no E-field or H-field which was above the minimum resolution of the Narda electromagnetic survey meter and associated probes. The scan on the third floor included the transmitter room. This means that the fields within the Lehman home are well below the uncontrolled environment standard of 0.2 mW/cm^2 .

In order to estimate the magnitude of the field strengths which were present in the transmitter room, the upstairs office area, and two of the bedrooms on the second floor of the house, a Potomac Instruments FIM-71 field intensity meter was used. All measurements with the VHF field intensity meter were made with the antenna horizontally polarized. At each location, however, the antenna was oriented vertically and the vertically polarized field was observed to be lower than the horizontally polarized field